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## **CLAIMS**

## What is claimed is:

- 1. A method for automatically equalizing an audio signal, the method comprising: measuring spectral energy values for a plurality of frequency bands; determining spreaded energy values for each frequency band based on the measured spectral energy values and a spreading function, the spreading function defining a spread of spectral energy across frequency bands; and updating equalizer settings for each frequency band based on the measured spectral energy values and the spreaded spectral energy values.
- 2. The method of claim 1, wherein the step of measuring comprises: measuring frequency components for at least a portion of the audio signal; and equalizing each frequency component using the equalizer setting associated with the corresponding frequency band.
- 3. The method of claim 2, further comprising prefiltering the measured frequency components with an inverse of an equal loudness curve prior to equalizing each frequency component.
- 4. The method of claim 1, wherein the step of updating comprises updating the equalizer settings based on a ratio of the measured spectral energy values and the spreaded spectral energy values.
- 5. The method of claim 1, further comprising using the updated equalizer settings to amplify corresponding frequency bands of the audio signal.
- 6. The method of claim 5, wherein the step of using comprises using a fraction of the updated equalizer settings in the decibel domain to amplifying the audio signal.
- 7. The method of claim 6, wherein a smaller fraction of the updated equalizer settings are used for low and high frequency bands than for midrange frequency bands.
- 8. The method of claim 1, wherein the method is performed in response to actuation of a button for controlling initiation of automatic equalization.
- 9. The method of claim1, wherein the method is performed in response to actuation of a knob for controlling equalization strength.
- 10. A system for automatically equalizing an audio signal, the system comprising: means (120, 130, 140) for measuring spectral energy values for a plurality of frequency bands; means (150) for determining spreaded energy values for each frequency band based on the measured spectral energy values and a spreading function, the spreading function defining a spread of spectral energy across frequency bands; and means (160, 170)

for updating equalizer settings for each frequency band based on the measured spectral energy values and the spreaded spectral energy values.

- 11. The system of claim 10, wherein the means (120, 130, 140) for measuring comprises means (120) for measuring frequency components for at least a portion of the audio signal; and means (130) for equalizing the frequency components using the equalizer setting associated with the corresponding frequency band.
- 12. The system of claim 11, further comprising means (120) for prefiltering the measured frequency components with an inverse of an equal loudness curve prior to equalizing each frequency component.
- 13. The system of claim 10, wherein the means (160, 170) for updating comprises means (160) for determining the equalizer settings based on a ratio of the measured spectral energy values and the spreaded spectral energy values.
- 14. The system of claim 10, further comprising means (180) for using the updated equalizer settings to amplify corresponding frequency bands of the audio signal.
- 15. The system of claim 14, wherein the means (180) for using comprises means (180) for using a fraction of the updated equalizer settings in the decibel domain to amplify the audio signal.
- 16. The system of claim 15, wherein a smaller fraction of the updated equalizer settings are used for low and high frequency bands than for midrange frequency bands.
- 17. The system of claim 10, further comprising a button for initiating automatic equalization.
- 18. The system of claim 10, further comprising a knob for controlling equalization strength.
- 19. A method for automatically equalizing an audio signal, the method comprising: measuring spectral energy values for a plurality of frequency bands; comparing the measured energy values with a predetermined spectral energy distribution; and updating equalizer settings for each frequency band based on the comparison between the measured energy values and the predetermined spectral energy distribution.
- 20. The method of claim 19, wherein the step of measuring comprises: measuring frequency components for at least a portion of the audio signal; and equalizing each frequency component using the equalizer setting associated with the corresponding frequency band.